

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

Claim 1 (original) A superconducting circuit comprising:
a single flux quantum circuit using a high temperature superconductor; and
an interface circuit for said single flux quantum circuit,
wherein said single flux quantum circuit is provided with a first Josephson junction, and
said interface circuit is provided with a second Josephson junction made from a combination of
materials different from those of said first Josephson junction, and

wherein hysteresis in the current-voltage characteristic of said first Josephson junction is
smaller than hysteresis in the current-voltage characteristic of said second Josephson junction.

Claim 2 (original) The superconducting circuit according to claim 1, wherein said
interface circuit is formed of a latch driver circuit.

Claim 3 (original) The superconducting circuit according to claim 1, wherein a junction
in which hysteresis in the current-voltage characteristic is 10% or less is used for said first
Josephson junction and a junction in which hysteresis in the current-voltage characteristic is 10%
or more is used for said second Josephson junction.

Claim 4 (original) The superconducting circuit according to claim 2, wherein a junction in which hysteresis in the current-voltage characteristic is 10% Or less is used for said first Josephson junction and a junction in which hysteresis in the current-voltage characteristic is 10% or more is used for said second Josephson junction.

Claim 5 (original) The superconducting circuit according to claim 1, wherein said first Josephson junction and said second Josephson junction are each formed by a ramp edge junction.

Claim 6 (original) The superconducting circuit according to claim 2, wherein said first Josephson junction and said second Josephson junction are each formed by a ramp edge junction.

Claim 7 (original) The superconducting circuit according to claim 3, wherein said first Josephson junction and said second Josephson junction are each formed by a ramp edge junction.

Claim 8 (currently amended) [[The]] A superconducting circuit according to claim 1,
comprising:

a single flux quantum circuit using a high temperature superconductor; and

an interface circuit for said single flux quantum circuit,

wherein said single flux quantum circuit is provided with a first Josephson junction, and
said interface circuit is provided with a second Josephson junction made from a combination of
materials different from those of said first Josephson junction.

wherein hysteresis in the current-voltage characteristic of said first Josephson junction is smaller than hysteresis in the current-voltage characteristic of said second Josephson junction,

wherein said first Josephson junction comprises:

a lower electrode made from La-doped YBaCuO;

an upper electrode made from YbBaCuO; and

a damage layer formed between the lower electrode and the upper electrode, serving as a barrier, and

wherein said second Josephson junction comprises:

a lower electrode made from La-doped YBaCuO;

an upper electrode made from La-doped YbBaCuO; and

a layer made from LaSrAlTaO in addition to a damage layer formed between the lower electrode and the upper electrode, serving as a barrier.

Claim 9 (currently amended) [[The]] A superconducting circuit according to claim 2, comprising:

a single flux quantum circuit using a high temperature superconductor; and

an interface circuit for said single flux quantum circuit,

wherein said single flux quantum circuit is provided with a first Josephson junction, and said interface circuit is provided with a second Josephson junction made from a combination of materials different from those of said first Josephson junction,

wherein hysteresis in the current-voltage characteristic of said first Josephson junction is

smaller than hysteresis in the current-voltage characteristic of said second Josephson junction,

wherein said interface circuit is formed of a latch driver circuit,

wherein said first Josephson junction comprises:

a lower electrode made from La-doped YBaCuO;

an upper electrode made from YbBaCuO; and

a damage layer formed between the lower electrode and the upper electrode, serving as a barrier, and

wherein said second Josephson junction comprises:

a lower electrode made from La-doped YBaCuO;

an upper electrode made from La-doped YbBaCuO; and

a layer made from LaSrAlTaO in addition to a damage layer formed between the lower electrode and the upper electrode, serving as a barrier.

Claim 10 (currently amended) [[The]] A superconducting circuit according to claim 3,
comprising:

a single flux quantum circuit using a high temperature superconductor; and

an interface circuit for said single flux quantum circuit,

wherein said single flux quantum circuit is provided with a first Josephson junction, and
said interface circuit is provided with a second Josephson junction made from a combination of
materials different from those of said first Josephson junction,

wherein hysteresis in the current-voltage characteristic of said first Josephson junction is

smaller than hysteresis in the current-voltage characteristic of said second Josephson junction,

wherein a junction in which hysteresis in the current-voltage characteristic is 10% or less is used for said first Josephson junction and a junction in which hysteresis in the current-voltage characteristic is 10% or more is used for said second Josephson junction,

wherein said first Josephson junction comprises:

a lower electrode made from La-doped YBaCuO;

an upper electrode made from YbBaCuO; and

a damage layer formed between the lower electrode and the upper electrode, serving as a barrier, and

wherein said second Josephson junction comprises:

a lower electrode made from La-doped YBaCuO;

an upper electrode made from La-doped YbBaCuO; and

a layer made from LaSrAlTaO in addition to a damage layer formed between the lower electrode and the upper electrode, serving as a barrier.

Claim 11 (withdrawn) The superconducting circuit according to claim 1, wherein said first Josephson junction comprises: a lower electrode made from La-doped YBaCuO; an upper electrode made from La-doped YbBaCuO; and a damage layer formed between the lower electrode and the upper electrode, serving as a barrier, and wherein said second Josephson junction comprises: a lower electrode made from La-doped YBaCuO; an upper electrode made from La-doped YbBaCuO; and a layer made from LaSrAlTaO in addition to a damage layer

formed between the lower electrode and the upper electrode, serving as a barrier.

Claim 12 (withdrawn) The superconducting circuit according to claim 2, wherein said first Josephson junction comprises: a lower electrode made from La-doped YBaCuO; an upper electrode made from La-doped YbBaCuO; and a damage layer formed between the lower electrode and the upper electrode, serving as a barrier, and wherein said second Josephson junction comprises: a lower electrode made from La-doped YBaCuO; an upper electrode made from La-doped YbBaCuO; and a layer made from LaSrAlTaO in addition to a damage layer formed between the lower electrode and the upper electrode, serving as a barrier.

Claim 13 (withdrawn) The superconducting circuit according to claim 3, wherein said first Josephson junction comprises: a lower electrode made from La-doped YBaCuO; an upper electrode made from La-doped YbBaCuO; and a damage layer formed between the lower electrode and the upper electrode, serving as a barrier, and wherein said second Josephson junction comprises: a lower electrode made from La-doped YBaCuO; an upper electrode made from La-doped YbBaCuO; and a layer made from LaSrAlTaO in addition to a damage layer formed between the lower electrode and the upper electrode, serving as a barrier.

Claim 14 (withdrawn) The superconducting circuit according to claim 1, wherein said single flux quantum circuit is provided with a ground plane made from La-doped YBaCuO to restrain inductance in the single flux quantum circuit.

Claim 15 (withdrawn) The superconducting circuit according to claim 2, wherein said single flux quantum circuit is provided with a ground plane made from La-doped YBaCuO to restrain inductance in the single flux quantum circuit.

Claim 16 (withdrawn) The superconducting circuit according to claim 3, wherein said single flux quantum circuit is provided with a ground plane made from La-doped YBaCuO to restrain inductance in the single flux quantum circuit.

Claim 17 (withdrawn) The superconducting circuit according to claim 1, wherein said single flux quantum circuit and said interface circuit are structured to be a multi-chip module.